

**GENERAL CERTIFICATE OF SECONDARY EDUCATION**  
**MATHEMATICS C (GRADUATED ASSESSMENT)**  
MODULE M8 (SECTION B)

**B278B**

Candidates answer on the Question Paper

**OCR Supplied Materials:**  
None

- Other Materials Required:**
- Geometrical instruments
  - Tracing paper (optional)
  - Scientific or graphical calculator

**Monday 21 June 2010**  
**Afternoon**

**Duration: 30 minutes**



Candidate Forename		Candidate Surname	
--------------------	--	-------------------	--

Centre Number						Candidate Number				
---------------	--	--	--	--	--	------------------	--	--	--	--

**MODIFIED LANGUAGE**

**INSTRUCTIONS TO CANDIDATES**

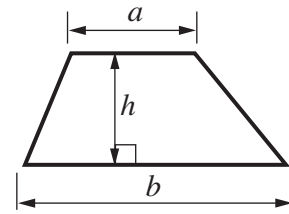
- Write your name clearly in capital letters, your Centre Number and Candidate Number in the boxes above.
- Use black ink. Pencil may be used for graphs and diagrams only.
- Read each question carefully and make sure that you know what you have to do before starting your answer.
- Show your working. Marks may be given for a correct method even if the answer is incorrect.
- Answer **all** the questions.
- Do **not** write in the bar codes.
- Write your answer to each question in the space provided. Additional paper may be used if necessary but you must clearly show your Candidate Number, Centre Number and question number(s).

**INFORMATION FOR CANDIDATES**

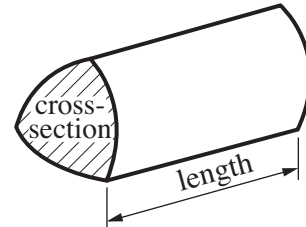
- The number of marks is given in brackets [ ] at the end of each question or part question.
- Section B starts with question 7.
- You are expected to use a calculator in Section B of this paper.
- Use the  $\pi$  button on your calculator or take  $\pi$  to be 3.142 unless the question says otherwise.
- The total number of marks for this Section is **25**.
- This document consists of **8** pages. Any blank pages are indicated.

## Formulae Sheet

Area of trapezium =  $\frac{1}{2}(a + b)h$



Volume of prism = (area of cross-section)  $\times$  length

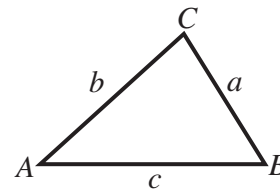


In any triangle  $ABC$

Sine rule  $\frac{a}{\sin A} = \frac{b}{\sin B} = \frac{c}{\sin C}$

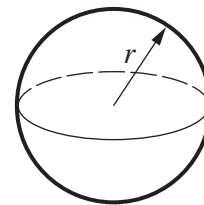
Cosine rule  $a^2 = b^2 + c^2 - 2bc \cos A$

Area of triangle =  $\frac{1}{2}ab \sin C$



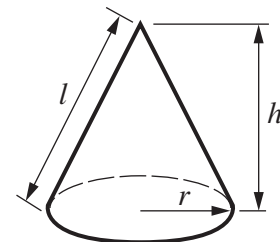
Volume of sphere =  $\frac{4}{3}\pi r^3$

Surface area of sphere =  $4\pi r^2$



Volume of cone =  $\frac{1}{3}\pi r^2 h$

Curved surface area of cone =  $\pi r l$



### The Quadratic Equation

The solutions of  $ax^2 + bx + c = 0$ , where  $a \neq 0$ , are given by

$$x = \frac{-b \pm \sqrt{b^2 - 4ac}}{2a}$$

**PLEASE DO NOT WRITE ON THIS PAGE**

- 7 (a) The Norfolk Wildlife Trust visitor centre at Cley collects 75 560 litres of rainwater from its roof in a year.

This is 65% of the total amount of water needed at the visitor centre.

Calculate the total amount of water needed for a year.



(a) ..... litres [3]

- (b) In 2007, there were 8500 pink-footed geese seen at a nature reserve. Each year this number has increased by 4% of its value the year before.

How many pink-footed geese are expected to be seen at this reserve in 2010?

(b) ..... [3]

8 This table shows the number of customers attending a cinema over a four-week period.

		Day						
		Sun	Mon	Tue	Wed	Thu	Fri	Sat
Week	1	201	132	181	292	307	513	602
	2	298	176	192	257	309	590	647
	3	257	211	184	292	401	612	718
	4	301	177	201	265	386	629	690

Calculate the 7-day moving average for Friday of week 3 to Thursday of week 4.

..... [2]

9 Solve algebraically these simultaneous equations.

$$3x - 2y = 4$$

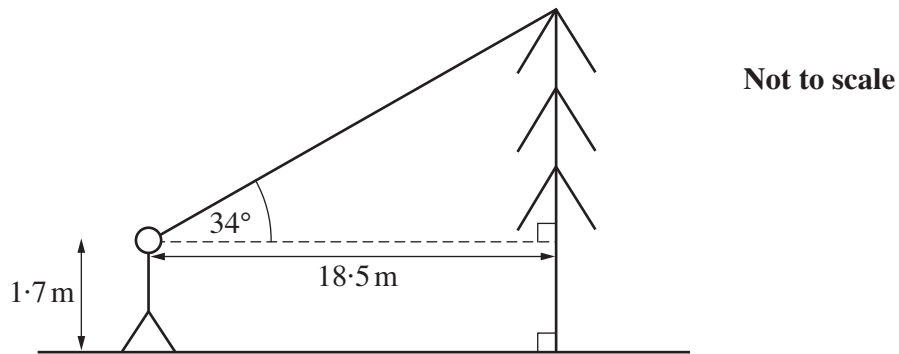
$$2x - 3y = 0$$

$x =$  .....

$y =$  ..... [4]

10 Class 10P uses angles to find the heights of trees in the grounds of Riverside School.

(a)



Hassan stands 18.5 m from a tree.

He measures the angle of elevation to the top of the tree as  $34^\circ$ , as shown.

His eyes are 1.7 m above the ground.

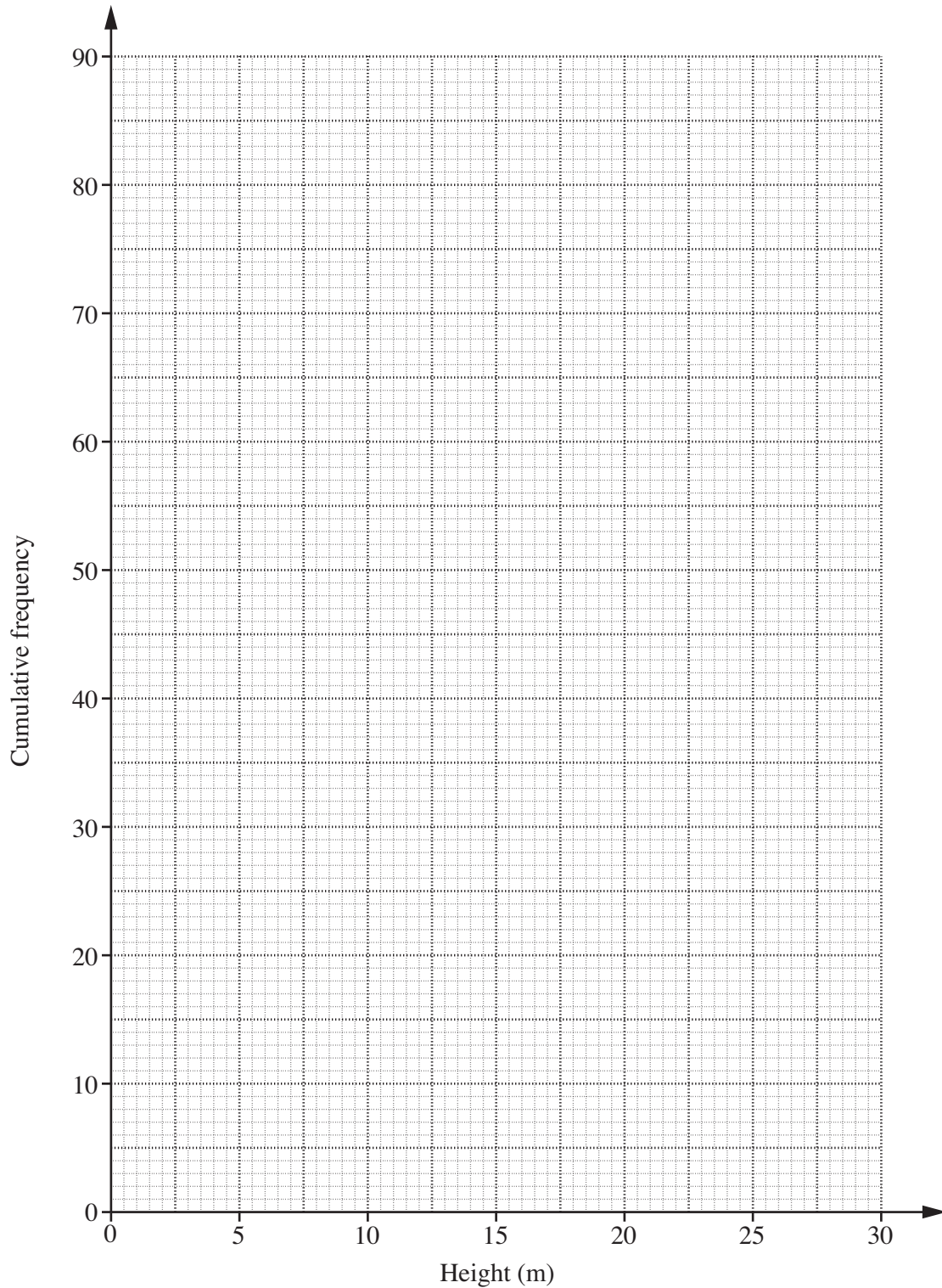
Calculate the height of this tree.

(a) ..... m [4]

- (b) This cumulative frequency table summarises the heights of the 90 trees in Riverside School grounds.

Height ( $h$ m)	$h \leq 5$	$h \leq 10$	$h \leq 15$	$h \leq 20$	$h \leq 25$	$h \leq 30$
Cumulative frequency	12	35	62	78	86	90

- (i) Draw the cumulative frequency graph for this distribution.



(ii) Use your graph to estimate the median height of these trees.

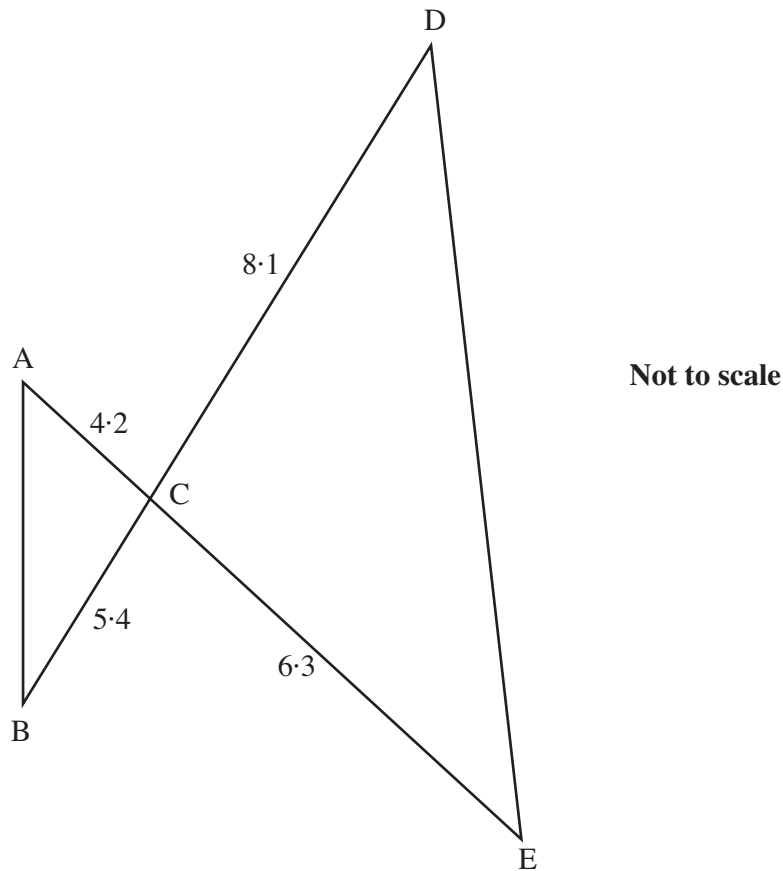
(b)(ii) ..... m [1]

(iii) Find an estimate of the percentage of the trees that are between 10 m and 18 m high.

(iii) .....% [3]

**TURN OVER FOR QUESTION 11**

- 11 ACE and BCD are straight lines.  
The lengths on this diagram are in centimetres.



Gemma says that triangles ABC and EDC are similar.

Show that Gemma is correct, giving your reasons.

.....

.....

.....

..... [3]

**Copyright Information**

OCR is committed to seeking permission to reproduce all third-party content that it uses in its assessment materials. OCR has attempted to identify and contact all copyright holders whose work is used in this paper. To avoid the issue of disclosure of answer-related information to candidates, all copyright acknowledgements are reproduced in the OCR Copyright Acknowledgements Booklet. This is produced for each series of examinations, is given to all schools that receive assessment material and is freely available to download from our public website ([www.ocr.org.uk](http://www.ocr.org.uk)) after the live examination series.

If OCR has unwittingly failed to correctly acknowledge or clear any third-party content in this assessment material, OCR will be happy to correct its mistake at the earliest possible opportunity.

For queries or further information please contact the Copyright Team, First Floor, 9 Hills Road, Cambridge CB2 1GE.

OCR is part of the Cambridge Assessment Group; Cambridge Assessment is the brand name of University of Cambridge Local Examinations Syndicate (UCLES), which is itself a department of the University of Cambridge.